a reflective subsystem having a plurality of reflective surfaces defining separate light paths of equal optical path length for the two separate beams, the reflective surfaces arranged such that when the two beams emerge from the beam shearing system they contain more than 50 percent of the photon flux and the chief rays of the two separate beams are substantially parallel to each other and substantially perpendicular to the chief ray of the incident beam.

2. (Amended) The beam shearing system in claim 1 wherein the two beams emerging from the beam shearing system contain substantially all of the light entering the system through the entrance slit.

3. (Amended) The beam shearing system in claim 1 wherein the two light paths defined by the reflective subsystem cause the wave fronts of the two separate beams to remain substantially in phase relative to one another when the beams emerge from the beam shearing system.

4. (Amended) The beam shearing system in claim 1 wherein the plurality of reflective surfaces are further arranged so that the separate beams of light are of substantially equal intensity, when they emerge from the beam shearing system.

5. The beam shearing system in claim 1 wherein:

the reflective subsystem comprises a plurality of bodies with a beam splitter therebetween; and

the entrance and exit surfaces of the plurality of bodies are substantially perpendicular to the chief ray of the received beam of light.

6. (Amended) A spectral resolving system comprising:

an entrance slit structure having an entrance slit extending in a first direction for receiving a beam of light having a photon flux within a predetermined spectral pass band;

a beam shearing system including:

a beam splitter aligned at an angle to the first direction so that the received beam of light is split into two separate beams;

a reflective subsystem having a plurality of reflective surfaces defining separate light paths of equal optical path length for the two separate beams, the reflective surfaces arranged such that when the two beams emerge from the beam shearing system they contain more than 50 percent of the photon flux and the chief rays of the two separate beams are substantially parallel to each other; and

an optical system configured to recombine the two separate beams of light emerging from the beam shearing system onto an exit pupil.

7. (Amended) The spectral resolving system of claim 6 wherein the optical system is also configured to recombine the separate beams of light emerging from the beam shearing system to create an image substantially perpendicular to the exit pupil plane.

8. (Amended) The spectral resolving system of claim 7 wherein:

the optical system has an optical axis;

the exit pupil is located in one of the group consisting of a tangential plane and a sagittal plane relative to the beam shearing system;

the image is located in the other of the group consisting of a tangential plane and a sagittal plane relative to the beam shearing system; and

the exit pupil and the image are located at substantially the same position along the optical axis.

9. (Amended) The spectral resolving system of claim 6 wherein the optical system is telecentric in object space, where the object of the optical system is the entrance slit.

10. (Amended) The spectral resolving system of claim 6 wherein the optical system is anamorphic.

11. (Amended) The spectral resolving system of claim 6 wherein the optical system cancels aberrations when it recombines the two beams of light that emerge from the beam shearing system.

12. (Amended) A static interferometer comprising:

fore-optics having an asymmetric pupil and configured to collect light and focus it into a beam;

a spectral resolving system comprising:

an entrance slit structure having an entrance slit extending in a first direction for receiving a beam of light;

a beam shearing system including:

a beam splitter aligned at an angle to the first direction configured to split the received beam of light into two separate beams;

a reflective subsystem having a plurality of reflective surfaces defining separate light paths of equal optical path length for the two separate beams, the reflective surfaces arranged such that when the two beams emerge the chief rays of the two separate beams are substantially parallel to each other; and

an optical system configured to recombine the two separate beams of light emerging from the beam shearing system onto an exit pupil.

13. (Amended) The static interferometer in claim 12, further comprising a detector located at the exit pupil.

14. (Amended) The static interferometer in claim 13 wherein the detector is configured to record pixels of incident radiation intensity.

15. (Amended) The static interferometer in claim 14 further comprising:

a data processing system connected to the detector; and

wherein the data processing system performs Fast Fourier Transforms on the digitized measurements to obtain the spectral composition of the incident radiation.

16. (Amended) The static interferometer in claim 14 further comprising:

a data processing system connected to the detector; and

wherein the data processing system convolves the measurements with filters to detect the presence or absence in the spectrum of the incident radiation of frequencies of radiation characteristically emitted or absorbed by particular substances.

17. (Amended) The static interferometer in claim 12 wherein the two beams of light are recombined to form a single sided interferogram at the exit pupil.

18. (Amended) The static interferometer in claim 17 wherein the reflective surfaces of the reflective subsystem are configured such that when the two beams emerge from the beam shearing system they contain more than 50 percent of the photon flux of the received beam of light.

19. (Amended) The static interferometer in claim 12 wherein the chief ray of light collected by the fore-optics is substantially to one side of the optical axis of the beam formed by the fore-optics.

20. (Amended) The static interferometer in claim 12 wherein the fore-optics are telecentric.

21. (Amended) The static interferometer of claim 12 wherein the optical system also focuses the separate beams of light emerging from the beam shearing system to create an image.

22. (Amended) The static interferometer of claim 21 wherein:

the optical system has an optical axis;

the exit pupil is located in one of the group consisting of a tangential plane and a sagittal plane relative to the beam shearing system;

the image is located in the other of the group consisting of a tangential plane and a sagittal plane relative to the beam shearing system; and

the exit pupil and the image are located at substantially the same position along the optical axis.

23. A beam shearing system comprising:

an entrance slit structure having an entrance slit extending in a first direction for receiving a beam of light having a photon flux within a predetermined spectral pass band;

a beam splitter aligned at an angle to the first direction so that the received beam of light is split into two separate beams;

a reflective subsystem having a plurality of reflective surfaces defining separate light paths of equal optical path length for the two separate beams, the reflective surfaces arranged such that one of the separate beams undergoes one reflection and the other of the separate beams undergoes three reflections and that when the two beams emerge from the beam shearing system they contain more than 50 percent of the said photon flux.

24. (Amended) A static interferometer comprising:

fore-optics for collecting light and collimating into a beam, the fore-optics possessing an exit pupil;

a beam shearing system comprising:

an entrance slit structure having an entrance slit extending in a first direction for receiving a beam of light having a photon flux within a predetermined spectral pass band;

a beam shearing system comprising:

a beam splitter aligned at an angle to the first direction so that the received beam of light is split into two separate beams;

a reflective subsystem having a plurality of reflective surfaces defining separate light paths of equal optical path length for the two separate beams, the reflective surfaces arranged such that one of the separate beams undergoes one reflection and the other of the separate beams undergoes three reflections and that when the two beams emerge from the beam shearing system they contain more than 50 percent of the said photon flux; and

a detector located at said exit pupil where the two beams emerging from the beam shearing system converge.

25. (Amended) The static interferometer in claim 24 wherein the detector comprises a detector array, read out electronics and a data processing system.

26. (Amended) The static interferometer in claim 25 wherein:

the detector array records the intensity of the radiation incident on its pixels;

the read out electronics digitizes the intensity measurements made by the detector array and transfers them to the data processing system; and

the data processing system manipulates the digitized measurements to obtain information about the spectrum of the incident radiation.

27. (Amended) The static interferometer in claim 26 wherein the data processing system performs Fast Fourier Transforms on the digitized measurements to obtain the spectral composition of the incident radiation.

28. (Amended) The static interferometer in claim 27 wherein the data processing system convolves the digitized measurements with digital filters to detect the presence or absence in the spectrum of the incident radiation of frequencies of radiation characteristically emitted or absorbed by particular substances.

29. The static interferometer in claim 24 which further comprises:

an anamorphic optical system possessing an optical axis;

the exit pupil being perpendicular to the optical axis;

the optical system focusing the two beams emerging from the beam shearing system to create an image; and

the image being perpendicular to the exit pupil and perpendicular to the optical axis.

30. (New) The beam shearing system of claim 5, wherein an air gap exists between the beam splitter and one of the bodies.

31. (New) The static interferometer of claim 12, wherein the fore-optics have an asymmetric pupil and are telecentric in image space.

32. (New) The static interferometer of claim 30, wherein the fore-optics are constructed using a single lens, two or more lenses, a configuration of mirrors or catadioptric systems.

33. (New) A beam shearing system for shearing an incident beam of light having a chief ray, comprising:

a first prism possessing a first surface acting as a beam splitter;

a second prism positioned to create an air gap between the second prism and the first surface;

wherein the first and second prisms are positioned such that the incident beam of light is incident on the first surface at an angle that substantially prevents total internal reflection;

wherein the incident beam of light is split by the beam splitter into two separate beams of light that emerge from the beam shearing system; and

wherein the two beams of light are substantially parallel when they emerge from the beam shearing system and contain more than 50% of the incident light.

34. (New) The beam shearing system of claim 33, wherein both the beams of light emerging from the beam shearing system include infrared radiation.

35. (New) The beam shearing system of claim 33, wherein both the beams of light emerging from the beam shearing system include ultraviolet radiation.

REMARKS

Attached hereto is a marked-up version of the changes made to the above-identified application by the current amendment. The attached page is captioned "**<u>Version with markings to show changes made</u>**."